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Students' Perceptions Towards Artificial Intelligence Technologies in Higher Education

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ABSTRACT:

Artificial Intelligence has become one of the greatest inventions of the 21st century. It has changed many sectors of life, including education, healthcare, finance, government, and everyday living. It implies that Artificial Intelligence has many applications, including education, health, defence, communication, and various soft skills that Artificial Intelligence significantly influences. In the context of this study, researchers explore the perceptions of university students toward Artificial Intelligence, emphasizing how perceptions vary according to demographic variables such as gender, locality, semester, and stream. A self-made attitude scale was developed and administered to collect the essential data from the sample. Researchers used descriptive and inferential statistics for data analysis. The findings revealed that students have moderately positive attitudes toward artificial intelligence (AI). However, significant differences have emerged across gender, locality, semester, and stream. The study investigates the importance of Artificial Intelligence in education across academic disciplines and designs inclusive approaches to bridge the perception gaps. The results show that Artificial Intelligence is becoming increasingly important in shaping academic and professional futures. They also urge for educational policies that encourage ethical, critical, and informed use of AI technologies. Thus, researchers can indicate that Artificial Intelligence has diverse applications for the upliftment and betterment of human civilization. Therefore, we must develop an inclusive society where we can promote artificial intelligence with the values and ethical considerations.

Keywords: Artificial Intelligence, University Students, Perceptions, Gender, Locality, Semester, Stream

1. Introduction:

Artificial Intelligence has become one of the most transformative technologies of the 21st century (Lavric et al., 2024). It has changed numerous areas of life, including education, healthcare, finance, government, and everyday living. Nowadays, Artificial Intelligence is no longer limited to data science or computer science; it is gradually being incorporated into educational environments through teaching and learning, assessments, and virtual assistants. As these technologies continue to advance, it is essential to understand the perceptions of higher education students, professionals, and policymakers. Students' perceptions of Artificial Intelligence are critical in higher education because they affect learning behaviours, career aspirations, and readiness to adapt and adjust to new technologies. Negative perceptions may result in resistance, anxiety, or technological exclusion, while favourable perceptions may foster acceptance, involvement, and creativity. In order to create inclusive, adaptable, and prosperous educational policies that support the digital transformative agendas outlined in frameworks like the National Education Policy (NEP) 2020, it is crucial to understand the perceptions of the students toward Artificial Intelligence.

Prior research has primarily focused on the technological, infrastructure, and policy-related aspects of integrating AI in the education system, but the psycho-social dimensions of human beings, such as interest, anxiety, motivations, and perceptions, remain underexplored, particularly when it comes to students from different academic background (Luckin et al., 2016; Holmes et al., 2019). Moreover, several demographic variables such as gender, semester level, stream, and locality may influence how students perceive AI; yet, few studies have quantitatively analysed these differences in the Indian context. Previous research has indicated that male students who are enrolled in science and technology programs have more positive perceptions of artificial intelligence (AI). This is likely because of increased exposure and curriculum alignment (Verdugo-Castro et al., 2022). On the other hand, students from non-technical backgrounds or those from a lower academic background may be less familiar with or anxious about using AI-based technologies. The digital divide, often attributed to urban-rural disparities, also raises questions about equitable AI literacy and access.

Through this study, the researcher tries to fill the gaps by systematically investigating the perceptions of postgraduate students toward Artificial Intelligence technologies in the higher education system. Through a structured attitude scale, the researcher aims to find out the overall perceptions toward

AI-tech and explore the attitudinal differences across key demographic variables. The study also adds to our understanding of students' readiness for AI integration in higher education. It provides valuable guidance to teachers, researchers, curriculum developers, and educational policymakers who want to encourage responsible and inclusive AI-based education.

2. Review of Literature:

The use of AI-based technologies in higher education has grown steadily. Researcher studies both the technological and human aspects of adopting AI, including ethical issues, educational impact, institutional readiness, and student perceptions. Al-Surmi et al. (2021) investigated AI-based decision-making from a strategic organizational perspective. His study revealed that marketing strategy mediates the relationship between IT strategy and operational performance, while organizational structure moderates this effect. Though primarily management-focused, this work underscores the structural dimensions needed to support AI adoption, which can be extrapolated to educational settings. Alshahrani (2023) explored the impact of ChatGPT on blended learning. The study emphasized how AI-driven tools such as ChatGPT enhance learner engagement, motivation, and personalization of instruction. These insights are very significant for understanding how AI technologies affect student perceptions and transform educational experiences and behaviour. Li (2022), in his study, provided an inclusive framework for a reliable AI system, emphasizing ethical practices throughout the AI lifecycle, from data collection to governance. This study contributes a valuable approach on the ethical platform necessary for student trust and meaningful integration of AI-tech in higher education. Adhikari and Gope (2025) explore the perceptions and preferences of students regarding Artificial Intelligence in higher education. This study identified differences in perception across gender, academic stream, and locality, highlighting the diversity in attitudes present in student populations. Borchetia and Hazarika (2024) provided a policy-level outline of AI in the Indian education system, aligning its adoption with the National Education Policy (2020). This study encouraged AI literacy to be embedded within the curriculum, particularly in disciplines which has less technological exposure. Alzahrani (2023) applied the Unified Theory of Acceptance and Use of Technology (UTAUT) model to study the use of AI in higher education and found that performance expectancy had a significant impact on perceptions, whereas effort expectancy had a limited effect. This supports the idea that the use of AI-based technologies is motivated by perceived utility. Begum (2024) highlighted how Artificial Intelligence can revolutionize the educational sector. However, this study also highlighted the substantial financial and time investments required for successful implementation, suggesting that student enthusiasm must be balanced with institutional preparedness. Jain and Jain (2019) similarly examined the role of AI in Rajasthan's universities from the perspective of educators. Their findings confirmed AI's potential to revolutionize education but reiterated the need for infrastructural support and faculty training. Chatterjee and Bhattacharjee (2020) used structural equation modelling to analyze AI adoption in higher education. Their quantitative analysis confirmed that external factors, such as policy interventions, and internal factors, like technological infrastructure, influence successful AI integration. Zhu and Ren (2022) focused on the cognitive implications of AI in education. Their research in Taiyuan City found that AI-assisted courses influenced role cognition depending on instructional strategies and content. This insight is predominantly relevant to understanding how students mentally position themselves in AI-enhanced learning environments. Bit et al. (2023) explored broader socio-educational questions, particularly how AI will shape employment and human skill development. The study proposed personalized AI-driven learning paths to enhance teacher-student collaboration and individual skill-building. Holmes et al. (2019) supported the pedagogical potential of AI, advocating for adaptive learning environments that reduce teachers' cognitive load and enhance student outcomes. Luckin et al. (2016) similarly suggested that AI can automate routine tasks, allowing teachers to concentrate on more creative and complex teaching responsibilities (Paliszkiewicz, 2025). Williamson and Eynon (2020) raised important concerns about algorithmic bias, data surveillance, and ethical transparency in educational AI applications. Kumar and Singh (2021) documented a range of student attitudes in India, from scepticism to enthusiasm, underscoring the dichotomy of perception that is common in emerging environments.

Collectively, the literature review suggests a complex and multifaceted understanding of AI in education. One that takes into account demographic diversity, ethical limitations, pedagogical potential, and technological usefulness. Nonetheless, the majority of the studies are either conducted internationally or have a broad reach. So, there remains a need for localized, empirical investigations into how higher education students in specific regions, such as West Bengal, perceive and engage with AI in their academic and professional journey.

3. Objectives of the Study:

a) To assess the overall attitude of Postgraduate students towards Artificial Intelligence technologies in Higher Education.

b) To find out the difference between the attitude of postgraduate students towards Artificial Intelligence technologies in Higher Education, based on their gender.

c) To find out the difference between the attitude of postgraduate students towards Artificial Intelligence technologies in Higher Education in their locality.

d) To find out the difference between the attitude of Postgraduate students towards Artificial Intelligence technologies in Higher Education, across their semesters.

e) To find out the difference between the attitude of Postgraduation students towards Artificial Intelligence technologies in Higher Education, in their stream.

4. Hypotheses of the Study:

H_{01}: There is no significant difference in attitude towards Artificial Intelligence technologies in Higher Education between male and female postgraduate students.

H_{02}: There is no significant difference in attitude towards Artificial Intelligence technologies in Higher Education between urban and rural postgraduate students.

H_{03}: There is no significant difference in attitude towards Artificial Intelligence technologies in Higher Education between 2nd-semester and 4th-semester Postgraduation students.

H_{04}: There is no significant difference in attitude towards Artificial Intelligence technologies in Higher Education among Postgraduate students of different streams (Arts, Science, and Commerce).

5. Methodology:

5.1. Research Design:

The Researcher was adopting a descriptive quantitative research design to investigate the students' perceptions towards Artificial Intelligence technologies in Higher Education.

5.2. Population:

The population comprised postgraduate students in various departments of Sidho-Kanho-Birsha University. Approximately 3500 students are considered the population of the Study.

5.3. Sample and Sampling:

Through stratified random sampling, the researcher selected 200 students as a sample from the entire population to ensure proportional representation from gender, locality, semester, and discipline.

Table 1: Demographic Variables of the Study

Demographic Variables	**Category**	**N**
Gender	Male	91
	Female	109
Locality	Urban	78
	Rural	122
Semester	2nd Semester	121
	4th Semester	79
Stream	Arts	91
	Science	77
	Commerce	32

5.4. Tool for Data Collection:

A self-made '*Attitude Towards Artificial Intelligence Technology Scale*' was developed to measure students' perception toward Artificial Intelligence technologies in higher education on a 5-point Likert scale.

5.5. Reliability and Validity:

Reliability of the tools was measured by Cronbach's alpha. The value of Cronbach's alpha = 0.844, indicating high internal consistency. Content validity was ensured through expert validation.

5.6. Statistical Techniques:

Descriptive statistics, such as mean and SD, were used to represent the nature and characteristics of the data, and inferential statistics, such as independent samples t-tests and ANOVA, were used to analyse the hypothesis.

6. Data Analysis and Results:

6.1. Objective 1:

To assess the overall attitude of Postgraduate students towards Artificial Intelligence technologies in Higher Education.

Table 2: Shows the number, mean, and SD of the total Postgraduate Students

Category	**N**	**Mean**	**S.D.**
Post Graduate Students	**200**	**87.20**	**10.42**

Table 3: Shows the level of perceptions towards AI technologies of Postgraduate Students based on the cut-off point

Scores	**Frequency**	**Percentage**	**Levels of Attitude**
Above- 97.62	30	15%	**High**
Between-97.62 to 76.77	143	71.50%	**Moderate / Average**
Below-76.77	27	13.50%	**Low**
Total	**200**	**100%**	

From the above table, using the cut-off point, the investigator analyzes the objectives. Here, the Cut-off Point is M $\pm$ 1σ. It means, Mean=87.20., N=198 and σ=10.425. Hence M +1σ is (87.20) + 1× (10.42) = 97.62, and M -1σ= (87.20) – 1× (10.42) = 76.77. This information shows that most of the PG Students (143 in number), i.e., 71.50% of PG Students, had lies between 76.77 and 97.62. Hence, it revealed that the attitude of Postgraduate Students in Purulia District of West Bengal is neither more favourable nor unfavourable towards Artificial Intelligence technologies, nor average in attitude towards it.

6.2. Objective 2:

To find out the difference between the attitude of postgraduate students towards Artificial Intelligence technologies in Higher Education, based on their gender.

H_{01}: There is no significant difference in attitude towards Artificial Intelligence technologies in Higher Education between male and female postgraduate students.

Table 4: Showing the perception difference towards AI technologies between male and female Postgraduate students

Variable		**N**	**Mean**	**SD**	**df**	**Calculated t value**	**Critical t value**	**Ns/S**	**Remark**
G	**Male**	91	89.54	10.377	198	2.961	0.05 level 1.97	S	Fail to Accept
E									
N									
D	**Female**	109	85.24	10.102			0.01 level 2.60	S	Fail to Accept
E									
R									

The above table shows that the calculated t-value of 2.961 is higher than both the critical t-value at the 0.05 level (1.97) and the critical t-value at the 0.01 level (2.60). Hence, the H_{01} is rejected and the alternative hypothesis (H_1) is accepted; that is to say that there is a significant difference in Artificial Intelligence technologies between male and female Postgraduate students in Purulia district of West Bengal. Also, the mean score of Male Postgraduate students (89.54) is higher than the mean score of female Postgraduate students (85.24). This suggests that Male Postgraduate students have more positive perceptions about technologies related to Artificial Intelligence than Female Postgraduate students.

6.3. Objective 3:

To find out the difference between the attitude of postgraduate students towards Artificial Intelligence technologies in Higher Education in their locality.

H_{02}: There is no significant difference in attitude towards Artificial Intelligence technologies in Higher Education between urban and rural postgraduate students.

Table 5: Showing the attitudinal difference towards AI technologies between urban and rural Postgraduate students

Variable		N	Mean	SD	df	Calculated t value	Critical t value	Ns/S	Remark
RESIDENCE	**Rural**	122	86.94	11.112	198	0.427	0.05 level 1.973	Ns	Fail to Rejected
	Urban	78	87.59	9.306			0.01 level 2.601	Ns	Fail to Rejected

The above table shows that the calculated t-value of 0.427 is lower than both the critical t-value at the 0.05 level (1.97) and the critical t-value at the 0.01 level (2.60). Hence, the H_{02} is accepted and the researcher's H_2 is rejected; that is to say that there is no significant difference in Artificial Intelligence among urban and rural Postgraduate students in Purulia district of West Bengal. Also, the mean score of Urban Postgraduate students (87.59) is higher than the mean score of Rural Postgraduate students (86.94). This suggests that Urban Postgraduate students have more positive perceptions about Artificial Intelligence than Rural Postgraduate students.

6.4. Objective 4:

To find out the difference between the attitude of Postgraduate students towards Artificial Intelligence technologies in Higher Education, across their semesters.

H_{03}: There is no significant difference in attitude towards Artificial Intelligence technologies in Higher Education between 2nd-semester and 4th-semester Postgraduation students.

Table 6: Showing the attitudinal difference towards AI technologies between 2nd-semester and 4th-semester Postgraduate students

Variable		N	Mean	SD	df	Calculated t value	Critical t value	Ns/S	Remark
SEMESTER	**2nd**	121	86.47	10.559	198	1.217	0.05 level 1.973	Ns	Fail to Rejected
	4th	79	88.30	10.183			0.01 level 2.601	Ns	Fail to Rejected

The above table shows that the calculated t-value of 1.217 is lower than both the critical t-value at the 0.05 level (1.97) and the critical t-value at the 0.01 level (2.60). Hence, the H_{03} is accepted, and the researcher's H_3 is rejected; that is to say that there is no significant difference in Artificial Intelligence technologies between 2nd-semester and 4th-semester Postgraduate students in Purulia district of West Bengal. Also, the mean score of 4th-semester students (88.30) is higher than the mean score of 2nd-semester Postgraduate students (86.47). This suggests that 4th-semester Postgraduate students have more positive or favourable perceptions about Artificial Intelligence technologies than 2nd-semester Postgraduate students.

6.5. Objective 4:

To find out the difference between the attitude of Postgraduation students towards Artificial Intelligence technologies in Higher Education, in their stream.

H_{04}: There is no significant difference in attitude towards Artificial Intelligence technologies in Higher Education among Postgraduate students of different streams.

Table 7: Results of One-Way ANOVA for Stream

	Sum of Squares	**df**	**Mean Square**	**F**	**Sig. (p-Value)**
Between Groups	1239.912	2	619.956	5.990	0.003
Within Groups	20389.483	197	103.500		
Total	21629.395	199			

From Table 7, we found that the p-value is 0.003, which is less than 0.05, indicating that the difference in mean score of attitudes among the three disciplines is statistically significant. Therefore, the null hypothesis (H_{04}) is rejected. So, this analysis revealed that there is a significant difference in attitude towards Artificial Intelligence technologies in Higher Education among Postgraduate students of different streams (Arts, Science, and Commerce).

7. Discussion:

Through this study, researchers find out the postgraduate students' perceptions towards Artificial Intelligence technologies (AI) through five key objectives. Those are discussed below.

Objective 1: To assess the overall attitude of postgraduate students towards Artificial Intelligence technologies in Higher Education.

The descriptive statistics (Mean and SD) indicated that most students have a moderately positive attitude toward AI-based technologies, with 71.50% falling in the average range and 15% showing a high attitude. This shows that young people are more conscious and aware of using AI technologies, although they may not be completely excited or knowledgeable about it. This is consistent with research by Zawacki-Richter et al. (2019) and Kumar and Singh (2021), who found that Indian students have cautious optimism toward AI, likely due to their limited practical experience despite their increasing theoretical exposure.

Objective 2: To find out the difference between the attitude of postgraduate students towards Artificial Intelligence technologies in Higher Education, based on their gender.

This study found a statistically significant difference between the perceptions of male and female students regarding the use of AI technologies in higher education, with males displaying a more favourable attitude toward AI tech. This finding supports prior research by Verdugo-Castro et al. (2022), who found the gender gap in tech-related fields. The discrepancy can be the result of differences in exposure, self-efficacy, and cultural conditioning toward the use of technology, highlighting the necessity of designing AI curricula with gender consideration and providing interventions to boost female students' confidence.

Objective 3: To find out the difference between the attitude of postgraduate students towards Artificial Intelligence technologies in Higher Education in their locality.

It is interesting to note that the attitude towards AI among students in urban and rural areas did not differ significantly. This suggests a closing digital divide, which national digital literacy initiatives may bring about, better mobile internet connectivity, and the spread of AI-enabled technologies even in rural places. The finding counters older studies that noted disparities in technological exposure and supports a more equitable distribution of AI-related awareness across geographical boundaries (Borchetia & Hazarika, 2024).

Objective 4: To find out the difference between the attitude of Postgraduate students towards Artificial Intelligence technologies in Higher Education during their semester.

Although students in the 4th semester had higher mean scores, the difference was not statistically significant. This suggests that merely progressing through the semesters does not ensure that people's opinions about AI will improve. This finding raises the possibility that AI has not yet been successfully or consistently included in all subject areas, independent of semester. Early and scaffolded AI exposure, as emphasized by Holmes et al. (2019), may be essential to shape sustained and informed attitudes.

Objective 5: To find out the difference between the attitude of Postgraduate students towards Artificial Intelligence technologies in Higher Education in their stream.

A significant difference was found among the students from the Arts, Science, and Commerce backgrounds; while science students showed more positive attitudes than those in Arts and Commerce. Since AI concepts and tools are more prevalent in science courses, students in these streams may feel more confident and find greater relevance, which helps to shape their attitude towards AI-based technologies in higher education.

8. Policy Implementations of the Study:

This study reveals that the Postgraduate students of Sidho-Kanho-Birsha University express a favourable attitude or perceptions towards the application of Artificial Intelligence-based technologies in higher education. Hence, there is a discrepancy in the attitudes of urban and rural students toward AI-tech. Thus, authority can promote the AI-technology through the integration of our existing curriculum. The study also reveals that AI has vast applications in the educational ecosystem. It not only focuses on the nourishment of data, but also AI helps to reconceptualize our educational problems. From an academic perspective, this study has a significant impact on various areas of education, including liberal education, professional education, science education, technical education, and agricultural education, among others.

9. Conclusion:

The present study underscores a generally positive attitude toward Artificial Intelligence (AI) among postgraduate students of Sidho-Kanho-Birsha University. Also, it highlights the perception differences across gender, locality, semester, and stream. Male students and students from science backgrounds showed a more favourable attitude towards AI-based technologies in the higher education system. These differences suggest that exposure, relevance of discipline, and self-efficacy in dealing with technology significantly shape students' perceptions towards AI tech. The lack of significant difference based on locality also indicates a narrowing digital divide among urban and rural students, which may reflect increased access to digital tools and AI awareness across regions. These results also carry significant implications for AI-based education in higher education institutions. Curriculum developers and educational policymakers should acknowledge those demographic differences when developing AI-based educational content. Contextualized integration in non-technical fields like the arts and commerce, early exposure to AI applications, and gender-based pedagogy can help bridge the perception gaps and foster equal learning environments. This suggests that while technological infrastructure is important, student mindset and readiness play equally important roles in the successful integration of Artificial Intelligence Technologies in higher education. Fostering positive and informed student perceptions toward Artificial Intelligence technologies requires a balanced strategy that addresses both educational content and learner diversity.

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